FLOOD INSURANCE STUDY

CITY OF ELKHORN CITY, KENTUCKY

PIKE COUNTY

REVISED:

FEBRUARY 16, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER - 210356

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

This publication incorporates revisions to the original Flood Insurance Study. These revisions are presented in Section 9.0.

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FLOOD INSURANCE STUDY

CITY OF ELKHORN CITY,
PIKE COUNTY,
KENTUCKY

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of Elkhorn City, Pike County, Kentucky, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound flood plain management. Minimum flood plain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

This Flood Insurance Study was prepared by compiling existing hydrologic and hydraulic technical and scientific data prepared by the Federal Emergency Management Agency (FEMA) for purposes of the National Flood Insurance Program. The data were identified as the best available at the time of compilation of this Flood Insurance Study and should depict the general conditions of the flooding sources with relative accuracy. FEMA performed a cursory review and accepted the data as valid for purposes of this Flood Insurance Study and the National Flood Insurance Program. However, if better information is known to exist or has been developed since the date of this report, the information should be immediately forwarded to the Natural and Technological Hazards Division, Federal Emergency Management Agency, Atlanta, Georgia for consideration for revision of this study.

1.2 Authority and Acknowledgements

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were obtained from the Flood Insurance Study for the Pike County, Unincorporated Areas, Kentucky (Reference 1).

1.3 Coordination

On November 7, 1984, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the community and FEMA.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Elkhorn City, Pike County, Kentucky. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected based upon the extent and validity of available existing hydrologic and hydraulic data. Flooding caused by overflow of Russell Fork within the corporate limits was studied in detail.

Flooding on Elkhorn Creek within the corporate limits was studied by approximate methods.

2.2 Community Description

The City of Elkhorn City is located in southeastern Pike County in eastern Kentucky. It is completely surrounded by the unincorporated areas of Pike County. According to U.S. census data, the population increased from 1,081 in 1970 to 1,446 in 1980 (Reference 2).

Elkhorn City lies in a rugged portion of the Appalachian Plateau, which is characterized by sharp ridges and narrow valleys. Elevations range from less than 800 feet to over 1,800 feet above sea level. The Clinchfield Railroad, Chessie System, and State Route 97 are the main transportation facilities serving the city.

The climate of Elkhorn City is humid-mesothermal, with considerable fluctuations in the extremes of daily, monthly, and annual temperatures and precipitation. Average temperatures range from 37 degrees Fahrenheit (F.) in January to 76 degrees F. in July and August, with a mean temperature of about 56 degrees F. The average annual precipitation is 41 inches of rain and 16 inches of snow (Reference 3).

2.3 Principal Flood Problems

The history of flooding along the streams in Elkhorn City indicates that flooding can occur during any season of the year. Large frontal storms or decaying tropical storms produce the worst flooding along the larger rivers and stream systems. Summer-type storms occurring over small areas produce severe local floods without affecting adjacent areas. The mountainous topography of the basin is conducive to rapid concentration of runoff, resulting in fast rises of the streams, best described as "flash flooding." This condition has been aggravated by widespread timbering, strip mining, and other operations that remove forest and ground cover.

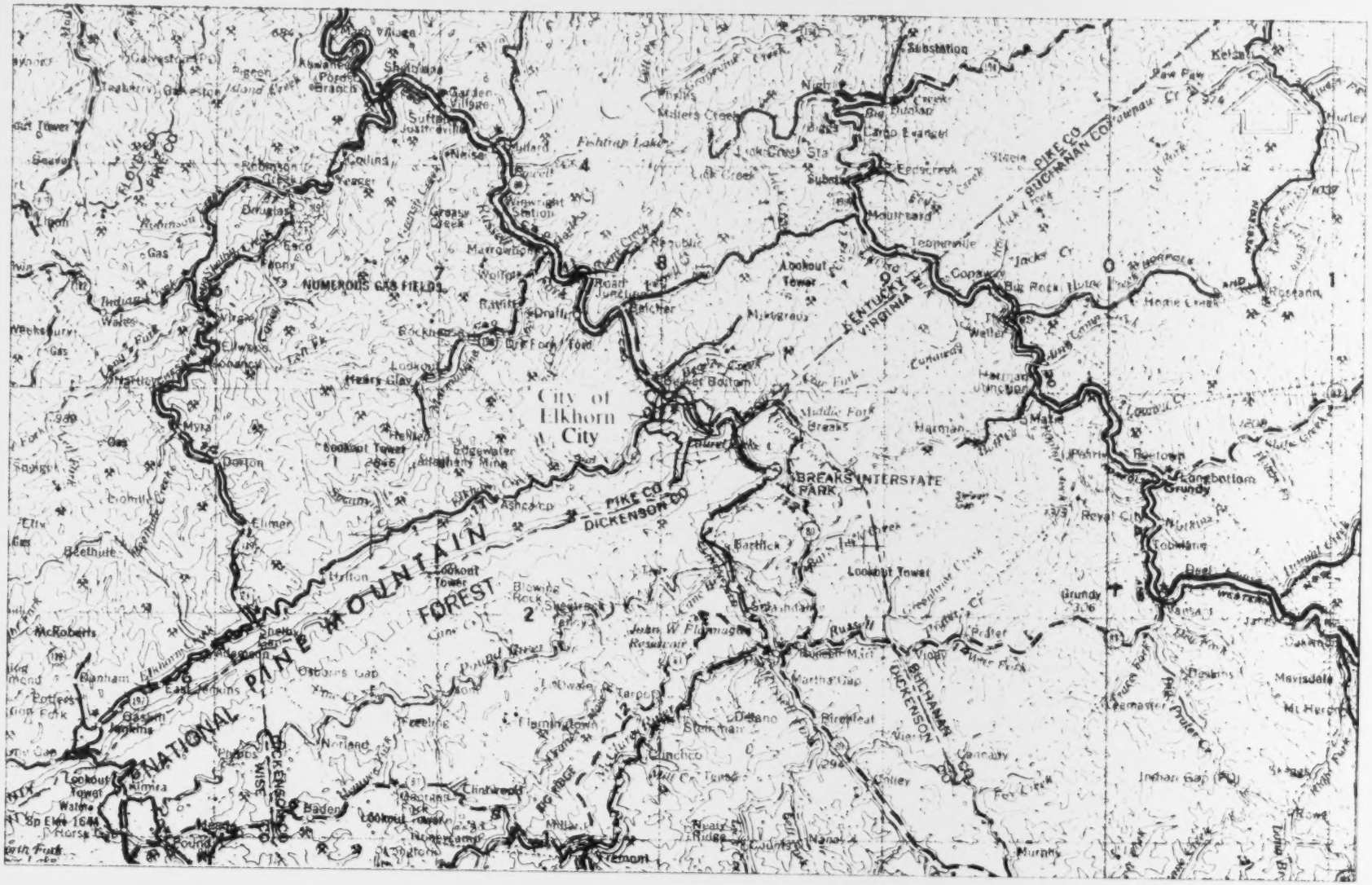


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ELKHORN CITY, KY

(PIKE CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

Floods are of short duration, seldom remaining above the flood stage for more than 24 hours.

Major flood problems have been damage to buildings and their contents, highways, railroads, and utilities. Floods generally occur without sufficient warning to allow removal of business stocks and equipment, house furnishings, and in many cases, automobiles to above flood level. Coalwashing wastes piled along the main and tributary streams during normal operations wash into the streams. The finer materials mix with silt and sand and are deposited in buildings, streets, and yards, thereby presenting difficult and expensive cleanup problems after floods. Principal means of access in the valleys are inundated or damaged, paralyzing business activities in some areas not otherwise affected.

2.4 Flood Protection Measures

J.W. Flannagan Lake, a large multipurpose reservoir, provides considerable flood protection along Russell Fork in Elkhorn City. The lake is located on the Pound River, a tributary of Russell Fork, about 2 miles above the mouth. It was authorized by the Flood Control Act of 1938 and the Federal Water Pollution Control Act Amendments of 1961 (P.L. 87-88). The dam was completed in 1963 and controls runoff from 221 square miles. This lake is operated for flood control, low flow augmentation, fish and wildlife conservation, and recreation. A similar multipurpose reservoir located on North Fork Pound River and upstream of J. W. Flannagan Lake and Pound, Virginia, operates as a system with J. W. Flannagan Lake for downstream floodflow reduction. As a result of these projects, flood stages have been reduced considerably on Russell Fork in Elkhorn City.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The natural discharge-frequency curve used in this study was developed from gage data on a regional basis in accordance with the method outlined in "Statistical Methods in Hydrology" (Reference 4) and U.S. Water Resources Council Bulletin No. 17 (Reference 5).

Floodway frequency analyses utilized the computer program "Flood Flow Frequency Analysis, Preliminary," October 1976 (Reference 6). A U.S. Geological Survey stream gaging station on Russell Fork in Elkhorn City was used in the regional analysis. The period of record of 27 years, a drainage area of 554 square miles, and an "n" value of 60 years were used in computing the expected frequencies of floods. Discharges on Russell Fork were modified by a routing procedure to account for the flood control effects of J. W. Flannagan Lake.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
RUSSELL FORK at Elkhorn City gage	554	31,000	45,200	54,200	77,600

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals.

Water-surface elevations of the selected floods, floodway data, and flood insurance zone data were calculated through use of the computer program "HEC-2 Error Correction 04, Modification 96," May 1981 (Reference 7). Cross-section data for all detailed study reaches were obtained photogrammetrically from aerial photographs taken in April 1980. The cross sections were located at close intervals immediately upstream and downstream of all bridges to compute the backwater effects of these structures. Bridge opening geometrics for the reach were obtained from field surveys (January-March 1981). Information on some bridge openings was obtained from the Kentucky Bureau of Highways and from the Chessie System.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles. For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map.

Channel roughness coefficients (Manning's "n") for water-surface computations were determined by characteristics of historical floods in the study reach and existing flood plain conditions. Roughness coefficients (Manning's "n") on Russell Fork range from 0.035 in the channel to 0.07-0.08 in the overbanks. Starting water-surface elevations were determined by the slope-area method.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations shown on the profiles are, thus, considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections the boundaries were interpolated using aerial photogrammetric strip mapping at a scale of 1:2400 with a contour interval of 5 feet (Reference 8).

For the streams studied by approximate methods only the 100-year flood plain boundary was delineated using the Flood Hazard Boundary Map for Elkhorn City (Reference 9).

The 100- and 500-year flood plain boundaries are shown on the Flood Boundary and Floodway Map. In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces the flood-carrying capacity, increases the flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was computed and are presented in Table 2, Floodway Data.

As shown on the Flood Boundary and Floodway Map, the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and the 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

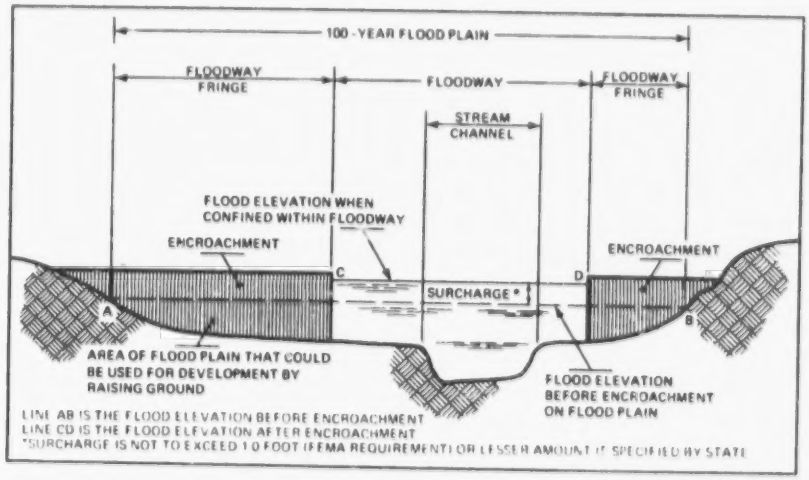

100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE *
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FIGURE 2 - Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
RUSSELL FORK								
A	11.465	331[2]	5698	12.7	774.2	774.2	774.7	0.5
B	11.819	308	6547	11.1	778.2	778.2	778.6	0.4
C	12.101	235	4734	15.3	779.4	779.4	779.9	0.5
D	12.247	243	4612	15.7	781.6	781.6	782.0	0.4
E	12.531	267	5931	11.2	789.9	789.9	790.3	0.4
F	12.681	309	7155	9.3	795.7	795.7	796.1	0.4
G	12.869	251	5652	11.8	795.9	795.9	796.3	0.4
H	13.173	301	5213	12.8	798.7	798.7	799.0	0.3
I	13.277	367	8310	8.0	806.4	806.4	806.4	0.0
J	13.437	581	11,786	5.6	808.7	808.7	808.8	0.1
K	13.543	683	8977	7.4	808.8	808.8	808.8	0.0
L	13.701	678	5781	11.5	812.8	812.8	813.3	0.5
M	13.814	419	6030	11.0	814.8	814.8	814.9	0.1
N	13.872	391	7412	9.0	817.2	817.2	817.5	0.3
O	14.098	285	6342	10.5	818.7	818.7	819.0	0.3
P	14.279	233	5484	12.1	819.9	819.9	820.2	0.3

[1]MILES ABOVE MOUTH
[2]THIS WIDTH EXTENDS BEYOND CORPORATE LIMITS

REVISED

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ELKHORN CITY, KY
(PIKE CO.)

FLOODWAY DATA

RUSSELL FORK

The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail affecting the City of Elkhorn City.

5.1 Reach Determinations

Reaches are defined as sections of flood plain that have relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The location of the reach determined for the flooding source of the City of Elkhorn City is shown on the Flood Profiles and summarized in Table 3, Flood Insurance Zone Data.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a riverine reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest 0.5 foot, multiplied by 10, and shown as a 3-digit code. For example, if the difference between elevations is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or FHFs determined.
Zone A11:	Special Flood Hazard Areas inundated by the 100-year flood, with base flood elevations shown, and zones subdivided according to FHFs.
Zone B:	Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- and 500-year floods by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and, areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding; not subdivided.

Flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are summarized in Table 3, Flood Insurance Zone Data.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Elkhorn City is, for insurance purposes, the principal product of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevations show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the National Flood Insurance Program.

6.0 OTHER STUDIES

A Flood Insurance Study for Pike County (Reference 1) is in progress and is in exact agreement with this study.

Due to its more detailed analysis, this Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for the City of Elkhorn City (Reference 9).

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (FEET NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
RUSSELL FORK							
REACH 1	0005	-6.9	-2.0	5.0	070	A14	VARIES—SEE MAP
REACH 2	0005	-6.0	-1.6	4.5	060	A12	VARIES—SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

REVISED 2/16/90

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ELKHORN CITY, KY
(PIKE CO.)

FLOOD INSURANCE ZONE DATA

RUSSELL FORK

7.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, 1371 Peachtree Street, N.E., Suite 736, Atlanta, Georgia 30309.

8.0 REFERENCES AND BIBLIOGRAPHY

1. Federal Emergency Management Agency, Flood Insurance Study, Pike County, Unincorporated Areas, Kentucky, in progress.

2. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Kentucky, Washington, D.C., February 1982.

3. ————, National Oceanic and Atmospheric Administration, National Climatic Center, Climatological Data for Kentucky, 1980.

4. U.S. Army Corps of Engineers, Statistical Methods in Hydrology, Leo R. Beard, Sacramento, California, 1962.

5. U.S. Water Resources Council, Bulletin No. 17, Guidelines for Determining Flood Flow Frequency, March 1976.

6. ————, Flood Flow Frequency Analysis, Preliminary, October 1976.

7. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Error Correction 04, Modification 96, May 1981.

8. L. Robert Kimball, Inc., Aerial Photogrammetric Strip Mapping, Scale 1:2400, Contour Interval 5 Feet, April 1982.

9. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Elkhorn City, Kentucky, March 1979.

9.0 REVISIONS DESCRIPTION

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood hazard data located at City Hall, South Center Street, Elkhorn City, Kentucky.

9.1 First Revision (Revised February 16, 1990)

a. Acknowledgments

The hydrologic and hydraulic analyses for this Revisions Description were performed by the U.S. Army Corps of Engineers (COE), Huntington District. The Federal Emergency Management Agency (FEMA) reviewed and accepted these data for purposes of this revision.

b. Scope

All flooding information for Russell Fork was revised as a result of the revised discharges.

c. Hydrologic and Hydraulic Analyses

The hydrologic analyses were performed by the COE using procedures described in section 3.1 of this report and in Bulletin No. 17B (Reference 10). However, additional years of stream gage records (1976 to 1985) were used, resulting in revised discharges. These discharges are given in Table 4, "Revised Summary of Discharges."

TABLE 4 - REVISED SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
RUSSELL FORK above Elkhorn Creek	555	37,600	56,700	66,500	96,800

The HEC-2 step-backwater computer program (Reference 11) was used to compute the 10-, 50-, 100-, and 500-year flood elevations using the new discharges that were developed by the COE.

Overbank roughness coefficients (Manning's "n") were revised for Russell Fork and range from 0.05 to 0.08. The channel roughness coefficient for Russell Fork was not revised.

Revised flood boundaries along Russell Fork were delineated using flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps prepared by the COE (Reference 12).

d. Floodways

Floodway computations for Russell Fork were revised as a result of revised discharges. The floodways were computed on the basis of equal conveyance reduction from each side of the floodplain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was revised and are presented in Table 2, Floodway Data.

e. Other Studies

A revision to the Flood Insurance Study for the Unincorporated Areas of Pike County is in progress (Reference 13) and is in agreement with this revision.

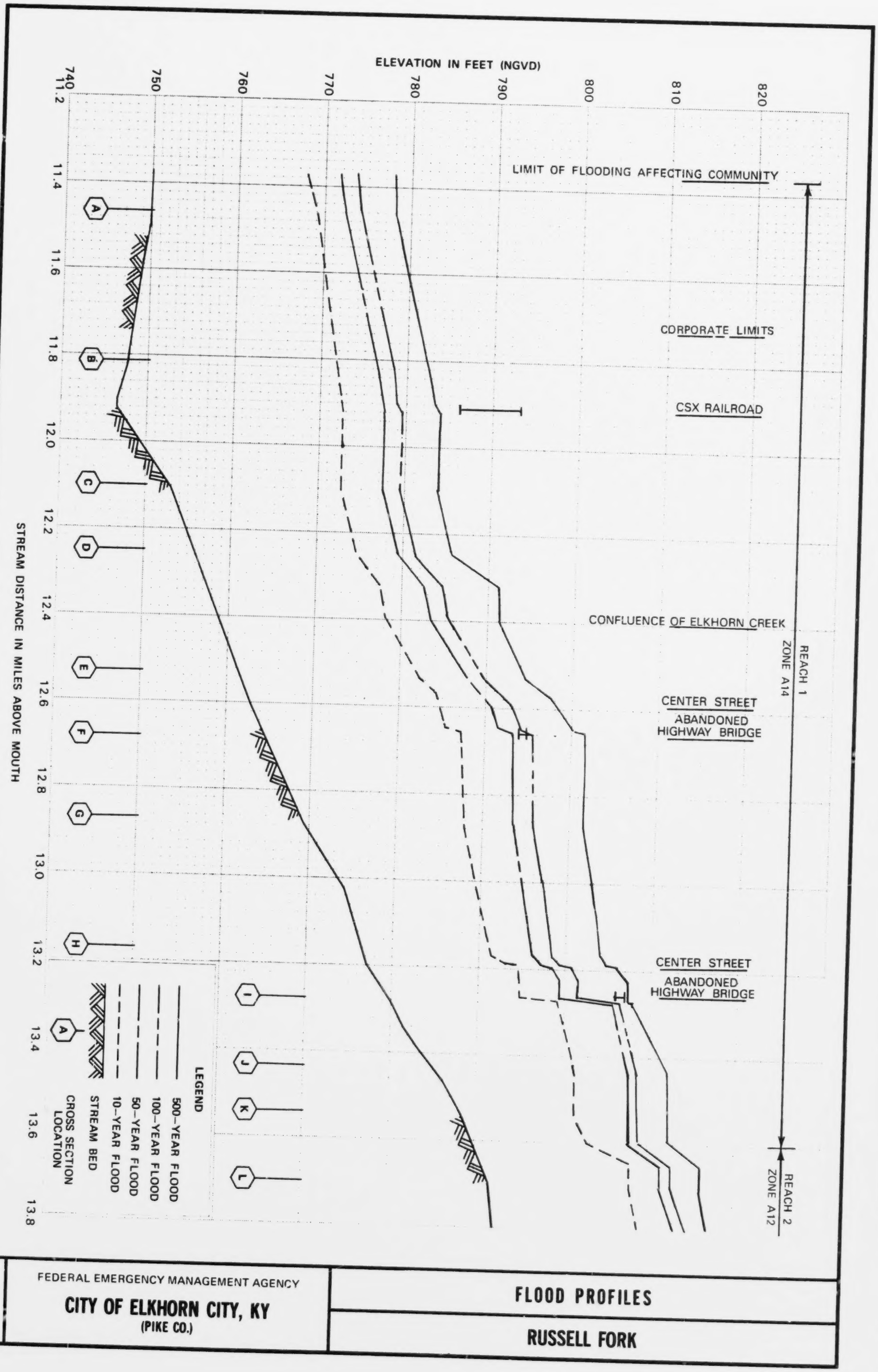
f. References and Bibliography

10. U.S. Department of the Interior, Geological Survey, Interagency Advisory Committee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee, Bulletin No. 17B, Guidelines for Determining Flood Flow Frequency, September 1981, revised March 1982.

11. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Computer Program 723-X6-L202A, Davis, California, April 1984.

12. ————, Huntington District, Combined Flood Insurance Rate Map and Flood Boundary and Floodway Work Map, Scale 1:2400, Contour Interval 5 Feet: Pike County, Kentucky, September 1982.

13. Federal Emergency Management Agency, Flood Insurance Study, Pike County, Unincorporated Areas, Kentucky, 1984, revision in progress.



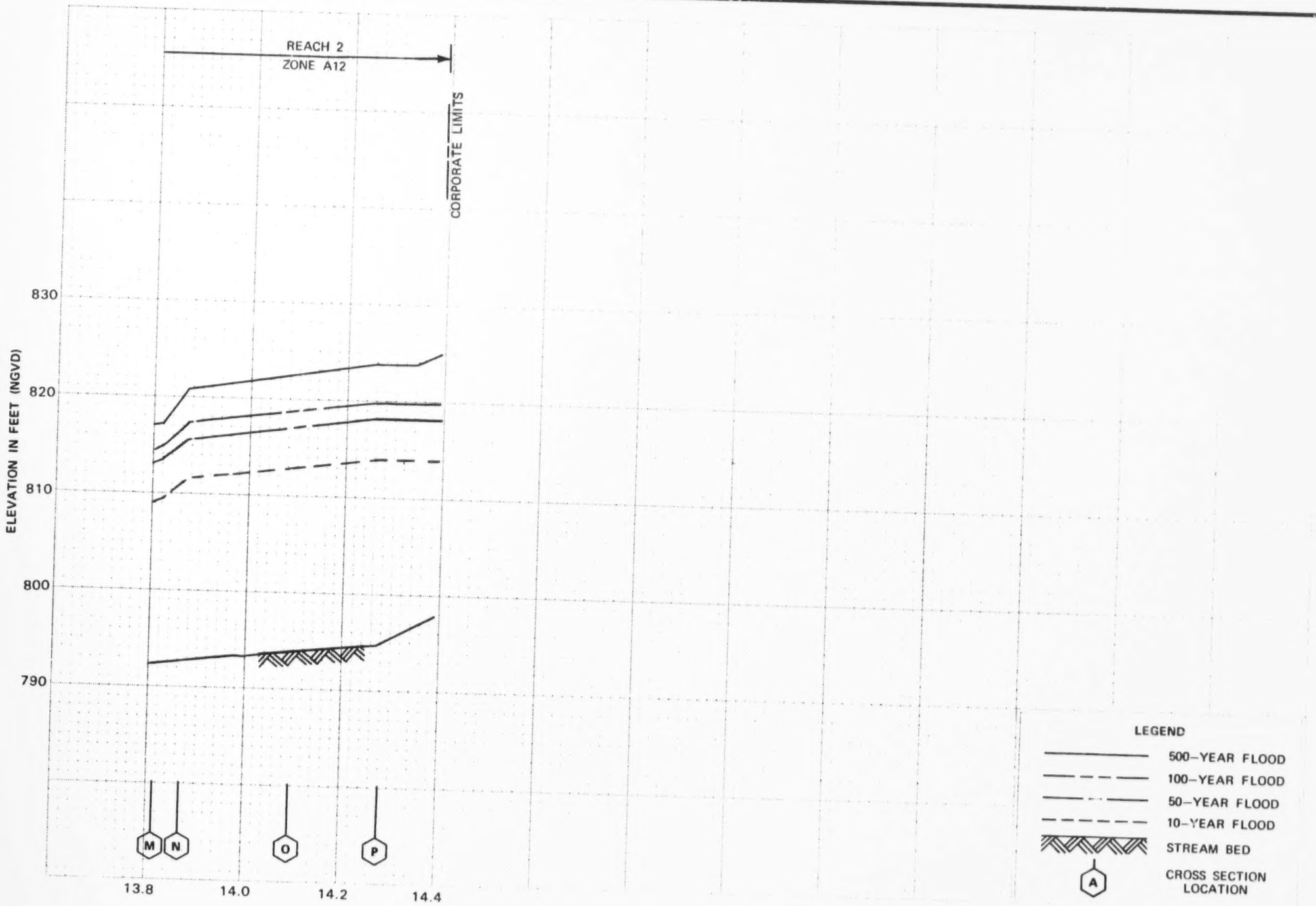
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ELKHORN CITY, KY
(PIKE CO.)

FLOOD PROFILES

RUSSELL FORK

01P



FLOOD PROFILES

RUSSELL FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ELKHORN CITY, KY
(PIKE CO.)

02P